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The chief purpose of this publication is to distribute information on aeronautics to the flying personnel in the Regular Army, Reserve Corps, National Guard, and others connected with aviation.

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THE STRATOSPHERE FLIGHT

ANNOUNCING during the course of a coast to coast radio broadcast on the evening of November 21st that the Contest Board of the National Aeronautic Association acted that afternoon to approve the mark of 72,395 feet above sea level as the official altitude of the Explorer II, the balloon of the National Geographic Society-Army Air Corps Stratosphere Expedition, Mr. William Enyart, Secretary of the Contest Board, stated that this figure was based upon calibration reports of the National Bureau of Standards experts who have been working on the problem since the arrival in Washington a week before of the sealed meteorograph taken while on the flight.

The Contest Board of the NAA, Mr. Enyart stated, will report the details of the flight to the Federation Aeronautique Internationale in Paris immediately, with the request that international certification be given this altitude as a new official world mark. In placing the sealed meteorograph in the Explorer II and in approving the 72,395 foot altitude, the NAA Board acted in its capacity as the representative of the FAI in the United States.

The previous official world altitude mark has been credited to Lieutenant-Commander G.W. Settle, U.S. Navy, and Major Chester L. Fordney, U.S. Marine Corps, who reached an official height of 61,236 feet in November, 1933. The Explorer II ascent betters their performance more than 11,000 feet.

Explaining the methods employed by the Bureau of Standards in testing the instruments carried by Captains Stevens and Anderson to ascertain the altitude reached by the Stratosphere Balloon, Dr. Lyman J. Briggs, Director of that Bureau, stated that in order to determine altitude it is necessary to have continuous records, both of the pressure and the temperature of the air in which the balloon is floating. The instrument used for measuring the pressure contains a hollow metal box with very thin flexible sides, which are folded or pleated like an accordion. As the air pressure on this closed box decreases the box lengthens and its movement is recorded as a curved line drawn on the smoked surface of the drum driven by a clock. A smoked surface is used in place of ink and paper because sharper lines can be obtained and ink would freeze at these low temperatures; in fact, it is difficult enough to get the clocks to run satisfactorily at temperatures 70 degrees below zero. Three of these pressure measure instruments were carried by the stratosphere balloon flight, one suspended thirty feet below the gondola and two others on top. All these instruments agreed closely regarding the minimum pressure reached by the stratosphere balloon.

In addition to the pressure, it is necessary to know the temperature of the air all the way from the ground to the highest altitude reached. This was measured by the change in the electrical resistance of a coil of wire located on a long arm projecting from the gondola and protected from the sun's heat by a series of shields. A little fan blew a strong blast of air over the resistance coil continuously in order to bring it to the temperature of the air.

During the past week, Dr. Briggs stated, Dr. Brombacher and his staff have been studying these instruments and comparing their performance with the laboratory studies of the same instruments made before the flight. The instruments have not changed and the records are, therefore, reliable.

Congratulating Captains Stevens and Anderson on behalf of the Trustees and members of the National Geographic Society upon their achievement in reaching the highest altitude ever attained by man, Dr. John Oliver La Gorce, Vice President of the Society, questioned Captain Stevens on several details connected with the stratosphere flight.

"Captain Stevens, being higher than man has ever been before you and Captain Anderson viewed more of the earth in one eyefull than any other person has ever seen, can you tell us how large an area was visible to you from nearly fourteen miles up?"

Captain Stevens: We could see in every direction for at least 200 miles. The earth was always in plain view underneath us.

Dr. La Gorce: What did you say to Captain Anderson at fourteen miles high, that is, do you recall the first words spoken at that altitude?

Captain Stevens: We were discussing the last reading of the thermometer showing

the gas temperature on top of the balloon. It registered zero centigrade.

Dr. La Gorce: How does it feel to be in a balloon at that great altitude?

Captain Stevens: We could tell our elevation after we passed the 40,000 foot mark only by looking at the gauges.

Dr. La Gorce: There are many questions that have been asked in the hundreds of letters received from all over the country. Were any instruments damaged in any way or did any of them fail to function properly?

Captain Stevens: No instruments were damaged, and so far all of the records that have been developed have come out good.

Q. What instruments determine the official record?

A. A meteorograph that hangs ten meters above the balloon.

Q. What is the object of taking spores that high, to see whether they live despite the intense cold or are affected by a rarified air?

A. Sunlight tends to kill the spores. However, most of the spores that were carried have survived the flight.

Q. What was the lowest temperature recorded during the entire flight?

A. A temperature of 78 degrees below zero was observed at 41,000 feet.

Supplementing Dr. La Gorce's observation that evidently it was not so cold at 72,000 feet as at 41,000 feet, Captain Stevens stated that in general the temperature decreases after one reaches the 50,000 or 60,000-foot mark. "We will know more about the real temperatures on reading the films that were obtained on the descent of the balloon when the gondola was preceding the balloon in the flight," Captain Stevens added.

Asked if he was annoyed by the clatter and the hum of the many instruments in the gondola, Captain Stevens admitted that it was disconcerting, but chiefly because it interfered at times with their radio conversation.

Brigadier-General Oscar Westover, Acting Chief of the Air Corps, addressing Captain Orvil A. Anderson and renewing his congratulations on the fine achievement which was just confirmed by the official record as to the altitude reached on the stratosphere flight, asked him if the balloon responded easily when gas was valved out or ballast released.

"I could hardly say that it responded easily," Captain Anderson replied. "It would be more nearly accurate to say that it responded as easily as could be expected of a balloon of such size to respond. It was like steering a larger ship which is harder to turn than a small ship because of its mass and momentum. It was necessary to release a great deal of gas to slow up the rise, and we had to throw out a considerable amount of ballast to get the balloon started upwards.

Gen. Westover: What was your most anxious moment during the flight?

Capt. Anderson: That is rather easy. It was during the first minute and a half of the flight. We had just risen above the rim of the cliff that encircles our take-off ground when a rather positive down-draft of air caught us and started the gondola downward toward the tree tops. We were only about seventy-five feet above the trees, and it was rather disconcerting for a few seconds. I released about 800 pounds of ballast, which was enough to overcome this downward force and to start us rising upward.

Gen. Westover: You say you released 800 pounds of ballast. How could you do that so quickly?

Capt. Anderson: It was by means of our electrical discharging system. We had sacks of ballast hung outside of the gondola, so we could open the bottom by exploding a dynamite type electrical discharging system. I was able to dump ten of the bags in less than ten seconds. If we had not installed this system, I do not think we could have dumped ballast fast enough to have saved the bag.

Gen. Westover: What was the appearance of the earth from your height?

Capt. Anderson: Why it was I should say an extension, so to speak, of the appearance from a higher airplane flight. We could look over very large areas but visibility was not very good.

Gen. Westover: What was the appearance directly before?

Capt. Anderson: The earth seemed like a huge mass. We could see the larger rivers and a few lakes very plainly. The towns and the regions over which we drifted were pretty small and it was hard to make them out from the highest part of our flight. Later when we approached the earth, we could see highways and towns quite plainly.

Gen. Westover: At what altitude did you open your manholes on the way down?

Capt. Anderson: At about 16,000 feet.

Gen. Westover: Was there a feeling of relief at being able to breathe fresh air?

Capt. Anderson: No, sir; we hardly noticed any difference. Our air conditioning system worked so well the air was good throughout the flight.

Gen. Westover: were you able to choose your landing place?

Capt. Anderson: Within certain limits. We were fortunately over good landing terrain when we approached the earth and the ground was not bad, so we were able to make an immediate landing.

Gen. Westover: Did your radio equipment function?

Capt. Anderson: Remarkably well. There was no time when we could not speak to someone on the ground and get an answer. It gave us a marked feeling of security to be able in this way to keep in continuous

touch with those on the ground.

Gen. Westover: Was there much of a jolt in landing?

Capt. Anderson: There was no jolt at all. We sank rather slowly to the ground, and just as the gondola touched we pulled the rip cord to let the gas quickly out of the balloon, and the gondola struck so lightly that it did not burst the inflated bumper on the bottom. It rolled slowly over on the side and it was not dragged for even a foot.

Gen. Westover: From an operative point of view, did you feel that the flight was a success?

Capt. Anderson: Yes, it was in my opinion successful beyond our hopes. There was no leakage of air from the gondola, and the balloon responded well to its controls. We reached a height greater than has ever been reached by man in a balloon, and all of the instruments functioned perfectly. Finally, and most important, we were able to bring all of the instruments and the records safely to earth without injury, and we believe that these records, which will be interpreted as rapidly as possible, will prove extremely interesting and we hope valuable additions to the world's scientific knowledge.

Gen. Westover: Was the air very thin at your highest point according to your own observations?

Capt. Anderson: Our means of observing the thinness by our own observation was through the action on a fan extended on an arm which was used for rotating the balloon. This fan at the higher altitudes had no effect at all and appeared to be running in a vacuum.

Dr. La Gorce asked Captain Anderson why it was necessary to discharge so much ballast on the descent. He said that the National Geographic Society received many letters of inquiry on this point.

Captain Anderson replied that at the peak altitude of the balloon the temperature of the gas in the bag was approximately 100 degrees fahrenheit. The condition of the gas at landing would be approximately 40 degrees fahrenheit, that is, over the outside atmosphere. This difference of temperature of approximately 60 degrees represents a positive lift in that as the temperature leaves the gas it contracts and reduces in lift. By computation it was estimated that about 2600 pounds of lift would be necessary to offset this contraction of the gas on returning to the ground. This computation worked out to be approximately true.

Newspaper editorial comment on the Stratosphere Flight were very interesting and worthy of note. An editorial in the WASHINGTON POST under the heading "Our New Frontier," was as follows:

"Scientific enlightenment expected to flow from the findings of Capts. Stevens and Anderson during their flights to the stratosphere does not explain the widespread interest in their exploit. Technicians will ponder over the balloon's instruments for new data on cosmic rays, meteorological conditions and electric currents. But the public sees something more in the flight. It may be that the public is right.

The very word "stratosphere" is new. In dictionaries published only a few years ago it is listed among the words that have just come into usage. Until Prof. Piccard went aloft in 1932 almost nothing was known of the upper reaches of atmosphere. Now this region is in the process of 'being conquered.' The current exploit grips our imagination, not because of any new scientific information it may bring to light, but because of the infinite possibilities opened by exploration of this new frontier.

In terms of distance the achievement may not be especially significant. These intrepid explorers got only 14 miles away from the earth. The important thing is that they did pierce that seemingly black void into which no human being has ever ventured and which our telescopes only vaguely reveal. That is a beginning. It may lead only to disappointment and destruction for those adventurous souls who will insist upon pushing ever farther into this forbidding region of the unknown. But that will not stop them. Nor will the inability of mankind to utilize the knowledge already in its possession arrest the struggle to untangle the still more baffling mysteries of the stratosphere. For beyond these first petty mileposts now established lies the universe.

Man has never been content with the nook in which he has found himself. There is no reason to suppose that he ever will be. Of course, it is idle to speculate on how far we may be able to push this new frontier outward into space. The one certainty is that man will continue to beat upon this barrier to new worlds. And after all, that may be the most important consideration."

"A vast public has watched with ever-increasing interest the stratosphere enterprise of the Army and the National Geographic Society," says the WASHINGTON STAR. "By grace of press, movies and radio, their four separate efforts to explore the upper skies have had a numerous audience. Yesterday's successful adventure especially enlisted the enthusiasm of the millions. There was a belief in a multitude of minds that Capt. Albert W. Stevens and Capt. Orvil A. Anderson would win victory at last, and the expectation was amply justified. * * * Thus, the entire voyage was an unmarred triumph for science, for the sponsoring agencies, for

the navigators and for the national spirit which prompted one trial after another in the face of difficulties and disappointments. * * * * The genius of the race, it seems, has been at work on the problem for a long time and with results indicative of still more thrilling penetration of the outer atmosphere. To Capt. Stevens and Capt. Anderson, then, and to all their predecessors, ancient and modern, a grateful salute from a myriad of admirers - people with the power to appreciate great performance!"

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TAKE YOUR CHOICE

In an interesting article on the Stratosphere Flight, wherein the biographies of both Captains Stevens and Anderson were given, one newspaper had this to say regarding the first-named:

"Tall, dark and reticent, Captain Stevens, who is unmarried, is wont to belittle his accomplishments and only on rare occasions speaks of his experiences:"

In another newspaper, the following rather startling piece of information appeared:

"It is not often that a man gets a chance to make a date with a girl from 10 miles in the air, but Capt. Stevens made a definite engagement with his wife to meet her in Washington tomorrow night. She is now in Chicago."

It is not known whether or not Capt. Stevens was interviewed concerning these two conflicting statements regarding his marital status. If he was, the chances are that his reply would have been substantially to the effect that the allegation that he is a married man is "grossly exaggerated."

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TC-13 AIRSHIP DAMAGED IN TAKE-OFF

The TC-13, second largest of Army "blimps," arrived at Brooks Field, San Antonio, Texas, on October 25th, en route from Langley Field, Va., to its new base at Sunnyvale, Calif. An advance party, flying in two Keystone Bombers, preceded the airship to make arrangements for and supervise landing and refueling at the various stopping points. This party carried a portable mast for use where hangar facilities were not available.

Unfortunately, when a take-off was attempted three days later, one of the mooring lines became fouled in the front landing wheel of the big airship, causing the wheel to give way. The ship skidded along the ground on the frame of the car, smashing the nose in and causing considerable damage. Repair work was completed on November 13th, when the airship was test flown.

The TC-13 departed from Brooks Field at 7:30 a.m., November 19th, proceeding to its destination, via Biggs Field, El Paso, Texas, and March Field, Riverside, Calif., and arriving at Moffett Field, Sunnyvale, Calif., at 9:00 a.m., November 21st.

The personnel accompanying the airship included Captain L. A. Lawson, pilot in command; Warrant Officer R.E. Lassiter; Master Sergeants A.G. Miller and R. H. Short; Technical Sergeant R.G. Quinn; Sergeant C.A. Wheeler; Corporal H. R. Erhard; Private, 1st Class, William J. Gould, and Private E. J. Collins.

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7TH BOMBARDMENT GROUP IN MIMIC WARFARE

With the departure of the Seventh Bombardment Group for Merced, California, its temporary home for a two-week period, Hamilton Field lost the major part of its military population.

Moving out bright and early on the morning of November 3rd, the Group took with it practically every piece of mobile equipment assigned. Only such transportation as would cover the barest minimum requirements of the post proper was left behind.

All four of the tactical organizations, the 9th, 11th and 31st Bombardment and the 38th Observation Squadrons, besides the 70th Service Squadron and details from the 69th Service Squadron and the 7th Bombardment Group Headquarters, departed to take part in this major phase of mimic warfare.

Remaining behind to garrison the post, the Station Complement is performing its usual duties of administration, guard, etc. The only other troops present are those of special units and part of the 69th Service Squadron.

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INDOOR BICYCLE CORPS IN AIR CORPS DEPOT

Of interest to visitors at the San Antonio Air Depot, Duncan Field, Texas, is the fact that the interior of the Engineering Shops building is so huge that (about seven acres under one roof) that an "Indoor Bicycle Corps" is needed to carry on business between the widely separated sections of the building. Some fifteen to twenty bicycles, issued by the Post Quartermaster, are in constant use by Engineering Department employees in delivering instruments, small parts, etc., and in running errands inside of the building, which results in a very considerable saving of time.

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General orders of the War Department, recently issued, announce the award of a Life-Saving Medal to Capt. Charles Y. Banfill, Air Corps, for rescuing four boys from drowning, June 23, 1932, in Boston Harbor.

REPTILE JOINS GOLF FOURSOME

By the News Letter Correspondent

When a Cobra, most venomous of reptiles, raises his standard of living to the point where he chases golf balls over the Fairway in company with his two-legged contemporaries, then that popular pasttime stops being "Sugar-coated Hiking," and takes on the color of adventure.

It all happened on the 17th fairway of the Fort Stotsenburg, P.I., course, under the very eyes of Major H.L.Kraft, M.C.; Major P.D. Moulton, M.C. (A.P.); Captain T. W. Steed and Lieut. W. M. Morgan, Air Corps. As they approached a golf ball, they spied a six-foot cobra joining the foursome and attempting to reach the ball ahead of them. Needless to say, the cobra won the race, took the ball in its mouth and started off.

For the benefit of the uninitiated, it should be explained that a procedure such as this is not considered good golf etiquette, even among amateurs. Protests from the four alleged golfers and their caddies were of no avail. In fact, to quote Captain Steed (a short time later and before the story had reached unbelievable proportions) "He spread out like a newspaper, hissed and fought back at us."

Realizing the power of the press, and being unwilling to antagonize the "animated newspaper" more than necessary, our heroes retreated and formed a fifty-yard circle around the snake, making an estimate of the situation at the same time.

By a vote of 3 to 1, it was decided that Lieut. Morgan, because of his dexterity, courage, and lower rank, would be given the honor of acting as the assault echelon in the attack. Slowly and cautiously the gallant Morgan advanced, golf club poised for action, with the whole-hearted encouragement and moral support of the distantly following reserve echelons. As he approached, the cobra struck. For a brief moment it seemed that this must be the end, but NO! Morgan and his club wheeled for a quick retreat - and the dastardly deed was done.

The snake had failed to recognize the irresistableness of a golf club and in striking at Morgan came in contact with the head of the club and was instantly killed.

In an exclusive statement, made for the Air Corps News Letter, Major Moulton stated, in part: "I cannot too strongly emphasize the credit due Lieutenant Morgan in so ably assisting me in killing the cobra, thus making golf at Stotsenburg safe for women andchildren."

Too bad the News Letter cannot have a picture of this alleged golf-playing reptile - just for a keep-sake.

MOTORIZING NATIONAL GUARD AVIATION UNIT

Prospects of the 41st Division Aviation, Washington National Guard, Felts Field, Spokane, Wash., being motorized in time for the June annual encampment looked promising in a communication received by Major Robin A. Day, commanding officer, from Adjutant General Maurice Thompson recently.

The Adjutant General asked for an immediate estimate as to the number of trucks necessary to move the personnel and equipment across the State to Camp Murray, adjoining Fort Lewis. Major Day advised that 20 Chevrolet trucks of the type mentioned by General Thompson would be necessary.

In the assignment of trucks to the 41st Division Aviation, no additional cost for a garage will be necessary to the State, as one of the old metal hangars is still standing and will serve well as a garage for motor equipment.

If the trucks are issued before the June camp, it means a motor trip of about 400 miles across the State and over the Cascade mountains for the personnel and equipment. On such a trip, requiring at least two days for the caravan, it is likely proolems will be executed between the group units and the flying personnel.

Such a problem would mean that overnight bivouacs would be held on one or more of the several improved airports across the State, thus making it possible for the flying personnel to contact their ground organizations before starting the final flight to the Fort Lewis airdrome.

At present the 41st Division Aviation has only a Chevrolet truck and ambulance, but is renewing its request for one of the reconnaissance-type cars now in storage at the Adjutant General's headquarters.

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AMPHIBIAN AIRPLANE VERY STURDY

Brigadier-General E.M. Shinkle, Assistant to the Chief of Ordnance, on a tour by air to inspect Ordnance activities, arrived at the San Antonio Air Depot in an Air Corps OA-5A Amphibian, piloted by Major Eugene L. Eubank, Air Corps, of Langley Field, Va. While General Shinkle visited Ordnance Department activities in the vicinity of San Antonio, mechanics of the Depot worked through Wednesday night, November 6th, checking and tuning up the airplane for a take-off the following morning for Montgomery, Ala. This giant Amphibian could not be accommodated in the regular hangar at the Depot and it was necessary to house it in the Engineering Shops building, where it was an object of much interest to visitors. This ship is as sturdy as a yacht. On one

occasion, it was said, when a forced landing compelled an overnight stay on the water, it was barely rocked by waves from a 35-mile wind.

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JAPANESE OFFICERS VISIT KELLY FIELD

A party of seven Japanese Army officers and one civilian engineer visited on November 7th the Air Corps Advanced Flying School at Kelly Field, Texas.

The visiting party included Major-General Shuiro Ito, Director General of Engineering of the Japanese Imperial Air Service; Major I. Imagawa, Lieut.-Colonels T. Ogata, Y. Sakaguchi, S. Enosawa, Major M. Kanda and Mr. K.Miura, civilian engineer. Arriving by car from Randolph Field at 2:00 p.m., accompanied by General Chaney, they were met at the entrance to Kelly Field by Colonels Fickel, Richards and Captain Burwell.

The visiting party was divided into groups, each being accompanied by an officer from the field. They then visited the Pursuit, Attack, Observation and Bombardment training sections, the camera obscura bombing range, and the indoor miniature range. A class of students was receiving instruction in the Regulation of Artillery Fire at the indoor range when the visitors arrived, and illustrative problems were "fired" for the benefit of the visitors and the method of instruction explained in detail.

It appeared that some members of the party were most interested in obtaining information on maintenance engineering practices, while other groups were obtaining such information as they could by examining the aircraft in use, training methods, tactical employment of aircraft, and administrative details, respectively.

The visitors, accompanied by General Chaney, left Kelly Field about 5:00 p.m. the same day.

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DEATH OF CAPTAIN BUCKMAN

The death on November 12th of Captain Donald Wells Buckman removed from the ranks of the Air Corps a promising young officer and a skillful Bombardment pilot. Captain Buckman was stricken by a heart attack midway between March Field, Riverside, Calif., and Bakersfield, Calif., while flying a Transport airplane, accompanied by three passengers, none of whom were aware of the pilot's condition until after he brought the plane down to safety at the Bakersfield airport. Stepping out of the plane, Captain Buckman collapsed in the arms of airport attendants. He was carried to a hangar, where he died shortly afterwards. Just prior to his death, he said he had been seized with a pain in the region of his heart when he was over the Mojave desert.

Captain Buckman was born at Portland, Oregon, April 10, 1901. He attended grammar school and high school in that city, and was a student at the Oregon Agricultural College, Corvallis, for two years. A private and noncommissioned officer with the 162nd Infantry, Oregon National Guard, for 4½ years, and a Staff Sergeant, 321st Observation Squadron, 96th Division, Air Service, for several years, he saw service on the Mexican Border and, during the war, in France, where he was a member of the First Division machine gun battalion.

Following his appointment as a Flying Cadet and his graduation from the Advanced Flying School, Kelly Field, Texas, he was, on October 20, 1923, appointed a second lieutenant in the Air Reserve, rated "Airplane Pilot," and assigned to active duty at Langley Field, Va. Four months later he passed the examination for a commission in the Air Corps, Regular Army, and continued on duty at Langley Field with the 2nd Bombardment Group.

Completing a tour of duty in the Panama Canal Zone, Captain Buckman was transferred to March Field, Calif., where, by virtue of performing the duties of Supply Officer, he was given the temporary rank of Captain.

The Omaha STAR published the following editorial in connection with the last flight of this officer:

"TRADITIONS OF THE AIR.

Aviation from the beginning has had ideals, but gradually it also is developing traditions. Thus it may be said to be following the customary pattern of human enterprise, whereby new activities start with dreams, move forward by experiment and at last are codified in governing principles. Medicine and law, obviously, reflect that variety of steady growth. The arts, the crafts and commerce almost as definitely have grown to maturity through unnumbered centuries of time. Plain folk summarize the interplay of cause and effect when they speak of a captain remaining on the bridge of his ship the while it sinks and an engineer holding fast to the throttle in an emergency which may occur during the run of his train.

Capt. Donald Buckman, perhaps, never paused to think of such things. He had been trained in the Army, and faithfulness to duty was instinctive in his mind. So it happened that, when he suffered a heart attack in midair a hundred miles from Bakersfield landing field, he did not collapse in panic and wreck his plane in the Mojave Desert. A power which he probably did not suppose he possessed helped him to complete the trip, bring his three passengers down safely and preserve his transport machine without damage. The ordeal was fatally severe, but the man himself was greater than his suffering. He

died before assistance could be summoned, yet not before history had written his name on a page of an immortal book.

To a philosopher the incident signifies a basic value in the evolution of the human race. Age after age, it seems, work increases in noble dignity and the competent performance of any assigned task takes precedence over purely personal interest. Victory and success, of course, are expressions of the soul of man, not self-created values. But, especially when a social factor is involved, the job has an importance which transcends that of the individual responsible for it. Actors epitomize the thought in the doctrine that 'the show must go on.'

Thousands of his countrymen paid Capt. Buckman the tribute of remembering in connection with his passing the beautiful words: 'Well done, good and faithful servant.' He could ask no richer fame, no rarer homage. A universal public is grateful for his inspiring example."

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APPROVES EMERGENCY LANDING SYSTEM

The Air Corps Detachment at Fort Lewis, Washington, voices its approval of the emergency landing system developed at Chanute Field, Rantoul, Ill. This system has been used at Fort Lewis for the past two years and has proved to be quite satisfactory. The method employed and the equipment used at Fort Lewis vary somewhat from that at Chanute Field. Ordinary highway obstruction markers of the kerosene torch type are used for marking the outline of the airdrome. In addition to this, a directional "tee" of green railway fuzees is placed at the point on the airdrome where the pilot should land.

This method could be used practically anywhere in emergency.

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GROUNDING PLANES DURING ELECTRICAL STORM

A Navy Department press release records the fact that recently, as the last plane of VP Squadron Five was being towed into the hangar during an electrical storm, the man operating the dolly guide received a static charge of electricity through his person. It is further stated:

"For some time this squadron has employed a grounding scheme by attaching a dangling training chain to tail dollies as is commonly employed by the ordinary commercial gasoline truck.

It appears from investigation that the plane had built up a static charge and the moment the ground lead bounced clear of the deck as it crossed the bumpy hangar door guard tracks, the man at the dolly received the full electrical charge. The operator, Seaman Moore, suffered no bodily harm, only the physical shock and fright which caused him to let go and to jump some six feet clear of the deck.

It is recommended that the practice of so grounding planes during electrical disturbances be adopted by all squadrons. It is observed that Pan American Airways in their operation from the Fleet Air Base ramps are very obedient in grounding their planes. They employ a ball and chain scheme similar to the round horse weight which was used by the antiquated milkman. This squadron is advised that this grounding scheme was adopted by Pan American after the loss by fire (static electricity) of a large Sikorsky on their ramp at Miami Beach."

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FIELD EXERCISES BY FORT LEWIS DETACHMENT

The Air Corps Detachment stationed at Fort Lewis, Wash., returned on October 26th from its two weeks' annual field exercise held at Salem, Oregon. The majority of the personnel, as well as equipment, were transported by air. This arrangement proved more satisfactory than trucks for this purpose.

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LANDING FIELD IMPROVEMENTS AT FT. LEWIS

The construction of a warming-up and taxi apron of concrete is under way at Fort Lewis, Washington. This project was delayed temporarily because of freezing weather, but is now nearing completion.

The landing area has been increased 300%. The field is of irregular shape and contains about 600 acres in all. Over half of this area is suitable for landings and take-offs. The rest is being levelled sufficiently to serve as a parking area in case it is desired to use the site as a base for Air Corps maneuvers. It is estimated that 300 planes of assorted types could be operated from the field efficiently. The landing area is over 300 feet across in almost any direction, and is marked by a white concrete circle. The surface is of natural gravel and is never soft. No lighting equipment is installed, but emergency equipment is satisfactory for pilots familiar with the field.

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The monthly Control Area Supply and Engineering Conference and Luncheon at the San Antonio Air Depot was held on November 5th, and was attended by Colonel J.E. Fickel, Commanding Officer of Kelly Field; Colonel Henry W. Harms, Commanding Officer of Randolph Field, and eleven other officers from various Air Corps activities, also officers of the Depot.

V-6909, A. C.

"AND I LEARNED ABOUT FLYING FROM THAT."

It was back in the year 1926, B.I. (Before Instruments), that I was flying in a P-1C airplane from McCook Field, Dayton, Ohio, to Bolling Field, D.C. Weather conditions were ideal all the way to Cumberland, Md., but here a great bank of clouds extended from the mountain peaks to about 8,000 feet.

On the trip from McCook Field to Cumberland I had been flying at 4,000 feet and had carefully checked my compass course. Being unable to go under the clouds from Cumberland on the course to Washington, I landed at Cumberland in order to obtain a weather report. In a few minutes the Cumberland radio station had contacted Bolling Field and obtained the weather report, which stated that at that field there were scattered clouds at 3,500 feet, whereupon I decided to take off, climb above the clouds and fly for about 45 minutes out of sight of the ground and then come down through them.

After having flown the allotted period of time, no openings were seen through the clouds as expected. Believing, however, that the ceiling still existed, I decided to glide down through and find Bolling Field or at least the City of Washington beneath me. Accordingly, the P-1 was set in a steady descent of about 100 miles per hour, and I went into the clouds at about 8,000 feet. I watched the altimeter drop gradually from 8,000 to around 2,500 feet, but I was still in the clouds.

Expecting to come out at almost any instant, I continued my glide until it was too late to make use of my parachute. Then, when my altimeter registered a negative reading, a dark spot appeared, and I came out in a little valley, about 150 feet from the ground, with the adjacent hills still in the clouds. I jerked the gun back and continued my glide straight ahead, landing on a long, narrow strip on the side of a hill and the plane coming to the end of its roll just as a haystack loomed up in front of me.

I had no idea as to where I was, and only hoped I was somewhere near Washington. Finally, a farmer appeared and told me I was near Indian Head, on the Rapidan River, which was entirely off my map. Upon asking for a map, I was informed that the nearest one to be had was in an atlas owned by a man living across the river. Inquiring as to how to get across the river, I was told that it would be necessary to ford it on horseback. I proceeded to borrow a horse and, upon inquiring as to the best place where the river could be forded, I was advised that if I permitted the horse to go his own way he would take me across, and this proved to be the case. The horse wandered here and there on the trip across, never touching a spot above his ankles and avoiding pools on both sides from ten to twenty feet deep.

Upon arriving at the house where the map was available, and which was in a 1900 atlas, I found that Indian Head was sixty miles southwest of Washington, my destination.

I slept that night in the haystack alongside my airplane and took off the next morning for Bolling Field.

Apparently, at 8,000 feet there was a terrific wind from the northeast, of which I had no knowledge, and which had blown me sixty miles off my course in the 45 minutes I remained in the air.

Moral: Winds blow in different directions at different altitudes.

On another occasion I was on a long cross-country flight, involving "hops" of from 1100 to 1500 miles, in an airplane having six separate tanks. On one particular leg of the flight, due to weather conditions, the course was flown at altitudes varying from 1,000 to 10,000 feet, with corresponding variations in temperature.

I had used a portion of the gas from the main tank and then had switched to various smaller tanks. A few moments after I switched back to the main tank, the engine coughed and slowly died, whereupon I was forced to land, with resultant nosing over and washout of the airplane.

All gasoline that had been poured into the tanks had been strained through two pieces of chamois. I was, therefore, positive that no water had been poured into the tanks. However, an examination of the sumps of the tanks revealed considerable water. The logical conclusion is that the water formed from condensation in the tanks during flight.

Moral: If on a long flight, do not use a portion of gas out of any one tank, but use all of the gasoline out of each tank.

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INSPECTING LANDING FIELDS IN PHILIPPINES

Three groups of pilots from Clark Field, P.I., during this quarter, made visits to the Southern Islands, inspecting landing fields in Zamboanga, Del Monte, Camp Keithley, Tacloban and Iloilo.

Despite the heavy rains, the 3rd Pursuit Squadron has been able to complete over one-third of the Training Directive during the past quarter.

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During the month of October, the Engineering Department of the San Antonio Air Depot, Duncan Field, Texas, overhauled 26 airplanes and 62 engines and repaired 20 airplanes and 15 engines.

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THE FIRST GORDON-BENNETT BALLOON CUP RACE

By Colonel Frank P. Lahm, Air Corps

TOWARD the end of the year 1905, James Gordon-Bennett, the well known proprietor of the New York HERALD, and one of the earliest and most generous donors of prizes for the encouragement of aerial sport, presented to the Aero Club of France, through the intermediary of Count Henri de la Valux, President of the International Aeronautic Federation, a cup valued at 2500 francs (at that time five hundred dollars). It was offered for competition in long distance free balloon contests under the rules of the International Federation. With the donation of the "Gordon-Bennett Cup" there was a condition that the Club of the pilot winning it agreed to organize a meeting and put the Trophy in competition the following year.

The first Gordon-Bennett balloon contest was organized by the Aero Club of France, and took place on September 30, 1906. The start was made from the Tuileries Gardens in the very heart of Paris. The rules of the competition allowed three balloons to be entered for each country affiliated with the International Federation, which had recently been formed and was just beginning to function. When the day arrived there were in all sixteen balloons entered, selected to represent seven clubs of leading countries of the world.

According to the regulations of the Federation, there are eight categories of spherical balloons, beginning with No. 1, holding 21,000 cubic feet of gas, up to No. 8, with a capacity of 144,000 cubic feet. For the Gordon-Bennett contest, the maximum size admitted was No. 5, about 80,000 cubic feet. The showing was especially gratifying and promising in view of the fact that ballooning as a sport was comparatively new.

Among the pilots entered were the leading aeronauts of the world, for the first time competing in an international contest. The countries represented were France, the United States, England, Belgium, Germany, Italy and Spain. One of the pilots was Santos Dumont, the well known Brazilian, but, although a contestant, he could not enter the competition for his native land, because Brazil at that time had no Aero Club and consequently was not affiliated with the Federation. The rules of the Federation allow an aeronaut of a nation not affiliated to qualify for a country whose quota of three entries is not full. Under this rule, Santos Dumont, who at the time was much in the public eye through the experiments he was making with his little dirigible or cigar-shaped balloon, entered for the Aero Club of America. Mr. F.S. Lahm was then the only citizen of the United States in France holding a pilot's license of the International Federation, and consequently the only aeronaut of our country eligible and available to enter the race. Previous to Mr. Santos Dumont's engagement, in order that this important contest should not take place without the flag of our country appearing at the start among those of other nations, he decided to enter as a competitor, although his sixtieth birthday had just gone by. Thus, there were two balloons of the United States engaged for the race.

In the summer of 1906 it happened that Mr. Lahm's son, Lieutenant Lahm, then a young officer of the American Army, in accordance with a custom of our War Department, was ordered to France for a course of one year at the French Cavalry School at Saumur. He had been initiated into the balloon game by his father in Paris in the summer of 1904, returned in the summer of 1905, and completed the requirements for a balloon pilot's license, which was issued to him by the French Aero Club that fall. Major James C. McCoy, one of the founders of the Aero Club of America and an officer of the Air Corps during the World War, arrived in Paris in the summer of 1906, became an enthusiast, and he and Lieut. Lahm devoted most of the summer to ballooning, at the end of which Major McCoy received his pilot's license.

Mr. Lahm then withdrew in favor of his son as a contestant in the Gordon-Bennett Race. Eleven of the sixteen competitors had ordered balloons of 80,000 cubic feet capacity built for the occasion. It was then too late to have one made for the American pilot, and there were none of sufficient capacity to be purchased, so the only alternative was to look about for a second-hand balloon, and one was found without difficulty, but it was of ten percent less lifting power than any of the others entered. Persons familiar with aerial contests realize that this is a great handicap. The larger the balloon, the more gas it holds and the greater quantity of sand ballast it carries, thus increasing the length of its life in the air and its chances for winning in a long distance competition.

There was the question of procuring a capable assistant, each aeronaut being allowed an aid, preferably one of his own country, although this is not obligatory. As there were no Americans in Europe experienced in this particular sport, Lieut. Lahm was forced to fall back on any foreigner who would be willing to go with him. Charles Levée, a

capable young French aeronaut, a friend of Lieut. Lahm's, who had made many balloon flights, including two from West Point, agreed to act as aid, but when his decision became known at the Aero Club of France there was much criticism of his action, and many arguments were offered to convince him that helping a foreigner compete against his own countrymen was an unpatriotic and not a laudable thing to do. Levée nevertheless held good, giving assurance each day that he could be depended on to go as he had agreed.

Several days before the contest, Major Henry B. Hersey, the well-known American Weather Bureau official, a former Rough Rider of '98, who rendered important service while in command of the Army Balloon School at Omaha during the War, and who had gone to Spitzbergen two years in succession with Walter Wellman in his attempts to reach the North Pole by airship, came to see Mr. Lahm on his arrival from the north. He wanted to know if it would be possible to go as aid to the Army officer. He was informed that all arrangements were complete and it was too late to change, but Mr. Lahm said: "Major, if on the day of the race you will be at the start, there is a possibility that you may go." That was exactly what happened.

An hour before the start of the race, Mr. Levee informed Lieut. Lahm that, owing to pressure put on him, he had changed his mind and would be unable to act as his aid. Major Hersey asked only time enough to go to his hotel for his overcoat and was then ready to go.

Handicapped by a smaller balloon, besides the fact that it was not new, undoubtedly the victory of these two comparative novices in the sport may be attributed to the American energy of the pilot, the metecrological experience of his aid, and the determination of both to win - the same qualities by which we have carried off the Gordon-Bennett Trophy many times since.

The beautiful afternoon of September 30th, 1906, was drawing toward sunset, and the sixteen great balloons were ready for the exciting take-off. Their rounded forms, gilded by the setting sun, swayed gently back and forth in the light breeze with a movement similar to that of captive elephants, at the very spot around the fountain of the Tuileries Gardens from which two French aeronauts, Charles and Robert, left the ground 140 years before, on one of the earliest balloon ascensions ever made, and the first where, instead of heated air, gas was used to inflate. It was estimated that there were two hundred thousand people in the Gardens and the Place de la Concorde to see the take-off.

The evening before the race, the competitors were entertained at a banquet presided over by Prince Roland Bonaparte, then President of the International Federation.

On leaving the Tuileries at 4:55 p.m., the American balloon headed south of west, then west and finally, on reaching the English Channel at 11:17 that night, the direction was north-west, which would have carried it toward Lands End. Over the water it changed to north, and the crossing was made under a full moon, the balloon in good equilibrium with little for the occupants to do but throw a little ballast when the guide rope touched the water, eat the supper they had brought with them, watch an occasional boat slip by, and finally look for signs of the English coast.

The pilot made some water anchors out of empty sand bags and hoops brought along for the purpose, to be used in case of heading out toward the Atlantic. A revolving light appeared at 2:30 a.m., which proved to be on a lightship, and at 5:30 a.m., the English shore was crossed with the lights of Chichester showing a couple of miles to the west. Soon the fog came up and the ground was hidden for several hours. At one time the sound of water, quite like the lapping of the waves on the Channel, produced quite a thrill and gave the impression that the balloon had left the shore and was out over the North Sea, but it was evidently only a little water fall. Along toward 7:00 a.m., the clouds began to break and the ground appear. The first task was to find out the balloon's location, but English farmers sleep late Sunday mornings.

The first inquiries as to the name of the country brought only one reply: "Where are you going?" Finally the answer came back: "Hants." After further shouting in unison, the name of the nearest town was heard. Then it was a simple matter to find the balloon's location on the map and keep it from then on over Stratford-on-Avon, Warwick Castle, Nottingham and Yorkshire County.

All day long the balloon was held down by valving, as an increase in altitude invariably carried it eastward, which meant the North Sea and the end of the flight. At 2:00 p.m., with the prospect of the evening condensation coming on later, it was decided to ease down from 10,000 feet to a lower level, catch the south wind and make Scotland that night. All went well for a time until suddenly the North Sea loomed up straight ahead in the haze, and it was necessary to valve hard. But the inhospitable "moors" did not appear inviting, with no habitations in sight, so after hitting the ground, the balloon was kept in the air by dint of much valving and the loss of ballast in large quantities, until the ground wind from the south carried it back to civilization. Then a turn in the coast line made it necessary to land. The light anchor did not hold and, after the first

contact, a brisk wind caused the balloon to carry on far enough for the basket to hurdle a stone wall; then the rip strip put an end to its mad career.

A good English squire, owner of the estate, came up in some wonder and grasped the situation with difficulty. It was hard for him to understand that it was a balloon and that it had come from Paris, but after it was explained that this was a balloon race, he finally understood, signed the required landing certificate, provided enough English money to get the aeronauts to York (they had only French and German money), and did everything possible to assist.

After folding the balloon and getting it started back to Paris by express, the aeronauts took the train for York and for a long night of much needed sleep.

Lieut. Lahm was awakened in the morning by violent pounding on his door. It was Major Hersey calling out that they had won, but Charles Rolls, one of the English team, was yet unaccounted for. On arriving at the Cecil Hotel in London late that afternoon, a bulletin gave the location of all the balloons. Nine had come down in France, a couple landing immediately on crossing the Channel, and the others all landed on the east coast but quite farther south than the winning balloon.

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COMBAT FIRING BY THE 16TH PURSUIT GROUP

The 16th Pursuit Group, stationed at Albrook Field, Canal Zone, conducted on November 7th combat firing on ground targets at their gunnery range, located at Rio Hato, Republic de Panama. Major-General Harold B. Fiske, Commanding General of the Panama Canal Department, and Colonel F.H. Smith, Chief of Staff, were flown to Rio Hato to witness the exercises. Three targets, nine feet wide and twelve feet high, were placed on the range, with 100 yards interval between targets. The firing was done by three-ship elements, diving from 1,500 feet altitude and firing at approximately 1,000 foot range. Both guns were fired, and each element made six approaches, firing 150 rounds from each gun during the six approaches. All of the P-12E airplanes of the Group took part in the firing.

At the conclusion of the exercises, General Fiske expressed himself to Lieut.-Colonel Charles T. Phillips, Air Corps, the Group Commander, as highly pleased at the percentage of hits obtained. Colonel Phillips told the Department Commander that the percentage of hits was higher than that obtained on two similar exercises recently conducted by the Group, but that he had no comparative figures on results obtained in similar exercises by other organizations.

The Gunnery Range of the 16th Pursuit Group at Rio Hato, R. de P., is approximately seventy miles from Albrook Field. During the gunnery season, which lasts approximately six months, a range detail of twenty-two enlisted men is maintained there. The field, one of the best natural landing fields in the Republic, is being constantly improved, and it is expected that within the next few weeks it will be sufficiently enlarged to permit landing by elements and flights.

For the combat exercises witnessed by the Department Commander, the Group did not land, on account of the time element, but commenced firing immediately after General Fisk's airplane had been parked on the 1,400 foot line.

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LIFE-SAVING MEDAL PRESENTED CAPT. BANFILL

Elsewhere in this issue of the News Letter, mention is made of the award of a Life-Saving Medal to Captain Charles Y. Banfill, Air Corps, in recognition of his service in rescuing four boys from drowning on June 23, 1932, in Boston Harbor.

The circumstances surrounding this incident were as follows: On the date mentioned, Captain Banfill was enroute from Baltimore, Md., to Boston, Mass., on a routine cross-country flight. An unusually strong wind was blowing on that day. Crossing Dorchester Bay, at an altitude of about 3,000 feet, and heading for the Boston Airport, Captain Banfill noticed a peculiar object floating in the bay. Throttling down the engine, he made a spiral in order to examine this object more closely. As he did so, he saw something moving which looked like a coat. Getting down to within about 500 feet of the water, he saw what appeared to be a small sloop which, having capsized, was under water with the exception of about a foot of the hull, to which four persons were clinging. The water was extremely rough, and there was a 35-mile off shore breeze which was blowing the boat out to sea.

In order to attract the attention of persons on the water front with the hope

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"OXYGEN-WANT" AND THE PILOT

By the Materiel Division Correspondent

A recent Engineering Section Memorandum Report issued by the Materiel Division under the title "Effects of Oxygen-Want (Anoxemia)" by Captain Harry G. Armstrong, Medical Corps, discusses the deleterious physical and mental effects due to the want of oxygen in the human system, in altitude flying, and is of general interest as well as of very particular interest to all flying personnel.

"Oxygen-want," Dr. Armstrong informs us, begins for certain individuals at comparatively low altitude, becomes moderately severe at 12,000 to 15,000 feet, and severe at 18,000 to 24,000 feet. That the seriousness of this want of oxygen is not generally understood by Air Corps personnel is evidenced by the frequency with which individuals fly at altitudes from 15,000 to 24,000 feet without oxygen equipment merely to see how high they can go, and also by the fact that a squadron commander recently seriously considered conducting squadron close formation training at 20,000 feet without oxygen.

It is desirable to instruct flying personnel in the dangerous results of insufficient oxygen pressure and supply to the body. Dr. Armstrong points out that in laboratory tests pilots can go from 15,000 to 17,000 feet without apparently ill effects, and that at high altitude usually no ill effects are felt at the time. Investigation, however, has proved such effects to be anything but harmless.

To understand the cause of oxygen-want at high altitudes, Dr. Armstrong writes, is to understand the fundamentals of respiration.

The atmosphere contains at all altitudes approximately 21% oxygen. At sea level with a barometric pressure of 760 mm. Hg. the oxygen exerts a partial pressure of 21% of 760, or 159 mm. Hg. It has been shown experimentally that it is the partial pressure of oxygen in the lungs and not the percentage that diffuses it through the alveolar walls and into the blood so that as the barometric pressure of the atmosphere is decreased at altitude likewise the oxygen partial pressure is decreased and the blood takes up less and less oxygen. Finally, a point is reached at which the cells of the body do not get enough oxygen and they begin to lose their ability to perform their functions. As the altitude increases, the body cells finally become damaged and unable to function at all. Unless this condition is corrected, the cells, and consequently the organism, dies. Unfortunately, the body makes little or no attempt to compensate for oxygen-want. This is due to the fact that the carbon dioxide accumulation in the body and not the lack of oxygen is the factor which determines to a great extent the breathing rate. Thus, at 15,000 feet, where one would expect great panting from oxygen-want, only slightly increased breathing is found, since the carbon dioxide accumulation within the body is approximately the same.

It has been found that in a person acclimatized to sea level conditions an ascent to at least 4,000 or 5,000 feet is necessary before oxygen-want begins to develop. Unfortunately, the first and principal effect is an anesthesia-like reaction in which the senses are dulled, and consequently the actual suffering of the body is masked so that the victim is wholly unaware of it. However, that the body is being damaged is well demonstrated by a stay at high altitude for from 12 to 24 hours, following which an attack of mountain sickness develops that one is not likely to soon forget. The symptoms of mountain sickness consist principally of nausea, vomiting, headache, diarrhea, muscular weakness and great general depression and prostration. This may last for only two days, but has been known to exist for as long as four weeks, which is ample proof of the damage to the body cells.

As altitudes above 12,000 feet are reached, the symptoms of oxygen-want appear more quickly and are due principally to the effects on the nervous system, as at lower altitudes, the anesthesia-like effect dominates the picture and the victim is in most instances blithely ignorant of his precarious condition, although it is easily demonstrated that he is becoming more and more iicapacitated as the ascent continues.

While different individuals react differently at different altitudes, it may be said that, as ascents above 12,000 to 15,000 feet are made, the average effects are as follows:

At first there is a loss of the sense of feeling and pain which, to a great extent, probably explains the absence of physical distress. At about the same time vision becomes much less acute; at altitudes around 18,000 feet the first effects on the higher mental centers become definitely established and are characterized by loss of insight and judgment, dulling of the intellect, loss of emotional stability, the development of fixed irrational ideas, the loss of muscular control and a temporary loss of memory. This becomes progressively worse with the time spent at that altitude and also as the altitude increases.

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By the time 22,000 to 24,000 feet is reached there may be fits of laughing or crying, impatience, rage or other emotional disturbances, and there may be great muscular weakness or paralysis. Usually vision at this altitude is approaching zero and the hearing is affected. The muscular incoordination or paralysis usually affects the muscles of the eyes so that depth perception is lost and diplopia or double vision may occur.

There is usually a state of stupor or sleepiness with a restricted field of attention, followed by a period of exhilaration closely resembling alcoholic intoxication during which a feeling of unusual well being and high efficiency is felt although the victim is approaching unconsciousness.

At higher altitudes the system is usually overcome and unconsciousness intervenes, and if not relieved has been known to cause mania, idiocy, brain hemorrhage, paralysis, blindness, permanent loss of memory, nerve tissue destruction, dilation of the heart and is frequently followed by pneumonia.

Not only, the report goes on to state, are those physical qualities, including visual acuity, eye muscle balance, depth perception, attentiveness, good judgment, keen intellect, alertness, and emotional stability so necessary for safe flying, impaired or temporarily in abeyance, but the effects are not fully relieved on returning to lower altitudes, so no doubt many a landing accident has been the result of such conditions. Two instances are cited to illustrate these contentions.

Recently during an altitude flight a member of a squadron lost his oxygen tube and continuing the flight ran amuck among the other airplanes of the formation and escaped a crash only by the ability of the other members of the squadron to out-maneuver him. During this time he was totally unaware of his actions and believed he was doing a masterful job of flying.

The second example has to do with a flight in which a pilot and passenger attempted to see how high they could go without oxygen. At about 20,000 feet the passenger noticed that the pilot had a very red sunburned neck which, as the climb continued, became very annoying to him. The sight of the red neck finally became so obnoxious to the passenger that he began to search about for a fire extinguisher or other weapon with which to kill the pilot (fixed irrational idea) and get the offending neck out of sight. Fortunately, no weapon was available and the pilot escaped probable death, although he flew at the airplane's ceiling, squashing along for over half an hour before he realized that they were unable to climb higher.

LIFE-SAVING MEDAL (Cont'd from p. 11)

of arousing such curiosity as to cause investigation to be made and rescuing parties to proceed to the spot where the imperiled youths were hanging on for their lives, Captain Banfill commenced performing antics in the air which certainly must have convinced spectators of one of two things - that here was a case of a good pilot going wrong or else that something unusual was happening on the Bay. He started a series of dives and zooms over the Bay, gave frequent bursts of the engine and, as he put it, made a big racket. He continued this for fully twenty minutes, during the course of which his main gasoline tank ran dry, leaving him with but 35 minutes more in the air with the fuel in the emergency tank.

It was with a feeling of great relief that Captain Banfill finally spied a launch putting out from the Coast Guard Station at South Boston. He then proceeded to make a succession of circles over the spot where the capsized boat was floating, thus acting as a guiding mark for the rescuing party.

The Coast Guardsmen stated afterwards that but for the aid which the circling airplane furnished, it would have been extremely difficult, if not impossible, for them to have located the upturned boat.

Captain Banfill, at present a student at the Command and General Staff School at Fort Leavenworth, Kansas, was presented the Life-Saving Medal recently by Brigadier-General H. J. Brees, Commandant of the School.

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NEW FLIGHT INSTRUMENT

An Engineering Section, Materiel Division, Memorandum Report announces the completion of a study of the suitability of a flight instrument comprising, in one unit, improved indication of turn, bank, and climb, and stating that procurement of two experimental articles is being initiated.

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ANNIVERSARY DAY CELEBRATED

The 12th Observation Group, Brooks Field, Texas, observed the fourth anniversary of its organization on November 2nd. A general holiday was declared and an extensive schedule of entertainment provided, consisting of the customary track meet - the main event - sack races, pie eating contests, three-legged races, and the usual other events with which military personnel make merry on such occasions. Each organization comprising the Group held "open house" at noon, entertaining the families of personnel at lunch. A downpour of rain interrupted the baseball game in the afternoon between the officers and enlisted men.

LIEUT.-COLONEL JOHN D. REARDAN, AIR CORPS

Dating his association with the Air Corps since the World War, Lieut.-Colonel Reardan's first duty assignment with the air branch of the Army was with the Spruce Production Division, becoming a member of the official family which administered the gigantic project of providing the necessary amount of spruce for the aircraft building program undertaken by the United States under the stress of the war emergency. On January 15, 1918, at that time a Captain of Infantry, Col. Reardan was appointed a Major (temporary) in the Signal Corps, and from that time until July 12, 1918, he commanded the Second Provisional Regiment at Vancouver Barracks, Wash., being commended by the Director of Air Service for his executive ability in bringing this organization to a marked degree of efficiency. From July, 1918, to February, 1919, he was stationed at Newport, Oregon, commanding the Yaquina District of the Spruce Production Corporation. On March 5, 1919, reporting for duty in the Office of the Director of Air Service in Washington, he was assigned as Chief of the Inspection and Purchase Sections of the Procurement Division, and he served in this dual capacity until July 15, 1919. Thereafter he served as Chief of the Purchase Section until the end of April, 1921. For several months towards the end of the year 1920, he occupied the positions of Acting Chief of the Procurement and Inspection Divisions. In addition to performing these functions, Col. Reardan served as a member of several Boards of Officers, one of them convened for the purpose of reorganizing the Office of the Director of Air Service, another to prepare regulations to assist Chiefs of Groups to carry out their functions. He was an Air Service representative on the War Department Technical Committee and Liaison Officer between the Purchase, Storage and Traffic Division of the General Staff and the Air Service in handling technical questions.

Col. Reardan was born June 3, 1885, in Salt Creek Township, Wayne County, Ohio. He enlisted in the Army in October, 1904, and served with the 85th Company, Coast Artillery Corps, as Private, Corporal and Sergeant until his appointment as a second lieutenant of Infantry, Regular Army, on January 24, 1908. He was promoted 1st Lieutenant on February 14, 1914; Captain, February 1, 1917; Major, July 1, 1920, and Lieut.-Colonel, August 1, 1931.

He began his flying activities in May, 1921, as a student at the U.S. Balloon School at Ross Field, Arcadia, Calif., and, upon the completion of his course of instruction, August 26, 1921, he was rated a "Balloon Observer."

From September 20, 1921, to January 15, 1922, he commanded the U.S. Balloon School at Fort Omaha, Nebraska. He was then transferred to Langley Field, Va., where he took up further lighter-than-air training at the Airship School, completing the course on June 22, 1922, and receiving the rating of "Airship Pilot." Seven years later, upon completing the course at the Air Corps Tactical School at Langley Field, Va., he received another rating, that of "Airplane Observer."

After completing the one-year course at the Command and General Staff School at Fort Leavenworth, Kansas, Colonel Reardan returned to Washington for duty in the Office of the Chief of Air Service, and for two years, from August, 1923, he occupied the position of Chief of the Procurement Section, Supply Group and, in addition, performed the functions of Contracting Officer for the Air Service and served as a member of the War Department Board on Contracts and Adjustment and the War Department Board for the standardization of war contracts.

A student at the Army War College, Washington, D.C., beginning in September, 1925, he was, upon graduating from this institution, assigned as Chief of the Air Section, War Plans Division, War Department General Staff. While on this duty he served as a member of the Joint Army and Navy Planning Committee, and was attached to the 19th Airship Company at Langley Field, Va., for flying activities.

His graduation from the one-year course at the Air Corps Tactical School at Langley Field in June, 1929, was followed by his assignment to duty at Wright Field, Dayton, Ohio, as Commanding Officer. During his two-year tenure of this position, he also served as Chief of the Administration Section, Materiel Division.

Completing the one-year course at the Naval War College at Newport, R.I., in June, 1932, he began another tour of duty with the War Department General Staff, being assigned to the War Plans Division. During the month of May, 1933, he acted as official observer at the Command and Staff Exercises of the Air Corps, which were conducted at March Field, Calif.

Upon his relief from duty with the War Department General Staff, in September, 1934, Col. Reardan was assigned to duty in the Plans Division, Office of the Chief of the Air Corps, where he remained until December 26, 1934, when he entered upon his present duties as Chief of the Information Division. So far as serving on Boards is concerned, he is far from a forgotten man, for at present he is the senior member of the War Department Special Committee on Air Bases.

LIEUT.-COLONEL ARNOLD N. KROGSTAD

Lieut.-Colonel Arnold N. Krogstad, Chief of the Personnel Division, Office of the Chief of the Air Corps, was born at Lanesboro, Minn., August 28, 1885.

Graduating from the United States Military Academy on June 11, 1909, he was commissioned a second lieutenant of Infantry, and assigned to the 22nd Infantry. He received his promotion to 1st Lieutenant on July 1, 1916; to Captain, May 15, 1917. and held the temporary rank of Major in the Aviation Section, Signal Corps, from June 3, 1918, to January 10, 1919. He was permanently commissioned a Major in the Air Service on July 1, 1920, and received his promotion to Lieutenant-Colonel on June 1, 1934.

Col. Krogstad's detail to the Aviation Section, Signal Corps, followed his 7½ years of service with Infantry. He received his flying training at the Signal Corps Aviation School at San Diego, Calif., and he received the rating of Junior Military Aviator June 15, 1917.

In the World War, his first assignment to duty in the Aviation Section of the Signal Corps was at Berkeley, Calif., where he organized and commanded the School of Military Aeronautics, University of California. From October 8 to November 10, 1917, he commanded the Provisional Battalion, comprising the 8th, 9th, 40th, 41st and 87th Aero Squadrons, at Selfridge Field, Mich. He next organized the Flying School at Rich Field, Waco, Texas, and was in command thereof until April 2, 1918, when he was transferred to duty in the Office of the Chief Signal Officer in Washington, and assigned to the Training Section. He remained on this assignment only five weeks, when he was ordered overseas for temporary duty as liaison officer in connection with the coordination of training activities and the collection of technical data. During the course of his service in France he flew over the front lines in the Nieuport type plane.

Returning to Washington in August, 1928, Col. Krogstad was again assigned to the Training Section, performing additional duty as President of a Board of Officers to select hydroplane and balloon coast defense sites. From November 5 to December 12, 1918, he was on duty in the Operations Section, Division of Military Aeronautics, following which he was transferred to Eberts Field, Loanoke, Ark., as commanding officer. Upon the abandonment of that field in the latter part of 1929, he was assigned as Commanding Officer of the Aviation General Supply Depot at Morrison, Va., where he served from December 31, 1919, to September 15, 1921.

Transferred to the Headquarters of the 2nd Corps Area at Governors Island, New York, Col. Krogstad was on duty as Air Officer until June 18, 1923, when, being due for foreign service, he was transferred to the Hawaiian Department, where he also performed the duties of Air Officer, September 3, 1923, to October 25, 1924. In April, 1924, he assumed command of Luke Field and continued in this capacity until January, 1926, when he was transferred to Langley Field, Va.

At this post at various times he performed such duty as Wing Operations Officer, Information Officer, Airways Officer, Commanding Officer of the 2nd Bombardment Group and Commanding Officer of the post. He pursued the one-year course at the Air Corps Tactical School, and graduated in June, 1928. For a period of nearly three years thereafter he again was stationed at Governors Island, N.Y., as Air Officer of the 2nd Corps Area, following which he was assigned to his present duty as Chief of the Personnel Division, Office of the Chief of the Air Corps.

During the months of May and June, 1933, he participated in the Air Corps Command and Staff Exercises at March Field, Calif., and Seattle, Wash., serving as Assistant Chief of Staff, G-1, on the staff of Brigadier-General Oscar Westover, who was in command of these exercises.

In the operation of the Air Mail Service by the Air Corps during the early part of 1934, Col. Krogstad performed the duty of Chief of Personnel, G-1.

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PRAISE FOR AIR CORPS PHOTOGRAPHIC WORK

In a letter to the Secretary of War, under date of November 12, 1935, the Hon. Daniel C. Roper, Secretary of Commerce, stated:

"Reports from field parties of the Coast and Geodetic Survey state that the aerial photographs in North Carolina taken by Lieut. A. Y. Smith and Sergeant H.L. Hachwith, and in Florida by Lieut. J.G. Pratt and Sergeant G.H. Fisher, are remarkably uniform in scale and of excellent photographic quality. Such photographs demonstrate thorough knowledge of many factors, the neglect of any one of which would vitiate the work as well as high skill on the part of personnel executing it. The uniform excellence of the photographs also demonstrates the efficiency of the 2nd and 4th Photo Sections of the Air Corps who accomplished the laboratory work.

The compilation of maps is greatly expedited by such aerial photographs. The Coast and Geodetic Survey is accordingly grateful for the care and skill with which they were made.

It would be appreciated if you will convey my thanks to the personnel of the Air Corps concerned for their efficient cooperation with this Department."

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Richards Field, Kansas City, Mo., is still seeking a spare hangar.

USE OF AVIATION IN AFRICAN WARFARE

The following is an extract translation of an article entitled "Colonial Aviation," by Major Vincenzo Biani appearing in the September issue of the Italian aeronautical publication "Rivista Aeronautica":

"In the various regions of Africa, the terrain is of widely differing nature. In the Sahara it is arid, without vegetation, and inhabited only near oases, which are located at very great distances from each other. As a rule the Sahara is of limited elevation, sandy or rocky, and open to observation and fire; it never rains and no clouds are to be found. In other zones, particularly in tropical and equatorial regions, mountainous formations, with altitudes attaining 4000 meters, are encountered. The mountains are covered with woods or bushes, and the valleys are inhabited by tribes living by agriculture and sheep raising. They are habitually nomad. In these regions rainfall is abundant, but limited to certain periods of the year - the rainy seasons - during which every communication is interrupted. Cloud formations are frequent, even for long periods of time.

The above shows that there are two typical regions, entirely different from each other which, however, from an aeronautical point of view, have in common a scarcity of inhabitants in comparison to the ground area, the enormous distances between the inhabited centres, and the very limited density of objectives against aerial attacks, due to the fact that the population lives in the open or in huts which may be easily abandoned.

Flight invariably presents considerable difficulty of orientation and often finds unfavorable weather conditions, both on account of high temperature and strong winds. As a rule, it must be limited to day time.

Tactical reconnaissance is relatively easy, as it may be carried out at very low altitudes without too much risk. Strategical reconnaissance, on the contrary, is very difficult on account of the various directions from which the enemy may advance, and of the enemy's ability to conceal his intentions. Practically, there is no difference between armed forces and civil population, often the troops are mixed with the civilians and march together followed by caravans and animals, so as to look like peaceful shepherds.

Bombardment must be carried out from a low altitude, and can be successful only if a large number of small bombs are employed.

Good results can be secured with machinegunning on account of the terror of the natives when planes fly very low, and the number of casualties which may be caused by trained and bold pilots.

During a combat between friendly and enemy ground troops, machinegunning from aircraft causes a double moral effect; depressive upon the enemy, encouraging upon friendly troops. In Libya, entire caravans and large camps were thus dispersed, against which little effect could have been secured with aerial bombs, due to the fact that the troops ran away and dispersed as soon as the airplane was heard.

It cannot be objected that this form of fighting is inhuman: soldiers never believed in an humanitarial warfare, which is only a fallacious and dangerous utopia of idealists and theorists living outside of reality, particularly today when war endangers not only a dynasty or the glory of a general, but the wealth, life, the future of an entire nation. It is impossible to think of a gentle war, in any case or against any enemy. Even less when it is the case of taming the pride of barbarian populations which menace the interests and the prestige of a great nation, which has before her and before history the high mission of defending and imposing her own mission of civilization.

Civilization is a wealth which can be propagated only through hard imposition, if those who must accept it are not ripe enough to receive it spontaneously and make it their rule for internal improvement.

The African people have a very simple and primitive conception of authority. They obey those who possess strength and know how to use it. They are more inclined to accept an abuse of violence than an act of weakness.

Hence, it is indispensable to give them the precise sensation that we are stronger than they, that we have better, more numerous and more deadly arms than themselves.

In evaluating the value of the life of noncombatant people, another factor, principally moral, must be taken into account. We cannot accept the evangelic principle that all men are creatures made to the similarity of God and equally dear to His heart. Should we admit that some indigens of barbaric costumes and habits must be considered at the same level and deserving the same respect as the Europeans, we would implicitly deny the evolution of centuries, which has created an abyss between the different races of mankind, different from each other and separated, in spite of the fact that, according to the biblic law, they all come from the same origin.

Aviation consequently must be employed on a large scale, and must be entrusted with all those tasks which may terrorize the enemy, so as to defeat promptly any intention of resistance on

their part. It is well to remember at this juncture that primitive and semi-barbarian people are easily gained by enthusiasm and also by discouragement. They exaggerate every sign or fortune or misfortune and can be extremely optimistic as well as desperately discouraged. They lack the strong conscience and internal discipline which is the source of the moral strength of the civilized man, who sometimes, from a momentary reverse derives the energy, the will and the courage to react and win.

This psychological inferiority of the primitive populations must be taken into account and must be exploited by the aerial arm in order to create a favorable atmosphere for the ground troops' advance. These will find a much easier task if the country has been disorganized and frightened by a preceding, vast aerial operation, which will be then continued together with the ground operations, and will finally be transformed into a police and control organization over the occupied territories. Three phases of employment of aviation may consequently be foreseen in a colonial campaign:

1. A preliminary phase carried out by aviation only, with reconnaissance, destructive and disorganizing tasks, strategical reconnaissance and attack of all enemy objectives.
2. A phase of air-ground cooperation in support of the operating troops, including: tactical reconnaissance, liaison, bombardment, machinegunning, logistic services.
3. A phase of occupation of the gained ground, including the aeronautical organization of the occupied zones (in order not to weaken the ground forces with the organization of too many garrisons), the survey of roads of communication between the troops and the rear bases, the watching of native populations, the repression of all attempts at insurrection.

It is evident that the tasks are various and of great magnitude, and require excellent planes, well trained personnel, a perfect organization of fields and fuel servicing, and a clever commander, active and full of initiative."

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PHILIPPINE TYPHOONS

By Lieut. W. E. Steele, Air Corps

The Philippine Islands are having the usual "unusual" typhoon and rainy season. The rainy season started unusually late, being well on into July before storms of any consequence arrived. Since that date, however, the Island of Luzon has been visited by a series of typhoons and accompanying rains, causing heavy floods, property damage, and loss of lives. It all started in July, when it seemed three separate typhoons got into an argument as to which one was to be the first typhoon of the season, and as a result Northern and Central Luzon experienced one of the heaviest rains in the history of the Islands. The duration of the three overlapping typhoons was from July 18th to August 6th, during which time the rainfall at Baguio was 120 inches and at Manila 35 inches.

During three days in August, the 2nd, 3rd and 4th, the rainfall at Baguio was 65 inches, the heaviest hourly rainfall being 3.2 inches. The resulting floods caused much property damage and the loss of several lives. The flat country in the vicinity of Mt. Arayat, from Calumpit to Vilaiis, was flooded with several feet of water. Many barrios were completely inundated. Railroad and highway traffic was completely paralyzed. The only mode of transportation on the streets of cities and to isolated barrios was by boncas or sampans.

Due to the sluggish drainage of the country, it was ten days before the water subsided sufficiently for normal traffic to be resumed. During this time Nichols Field maintained an air mail service to Clark Field.

Another typhoon visited us the first of October, and at the present time (October 15, 1935) the highways and railroads north of Manila are still under several feet of water.

The "new arrivals" are commencing to wonder if there is such a thing as a dry season.

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AIR DEMONSTRATION FOR RELIEF FUNDS

An announcement from March Field, Calif., was to the effect that on November 30th an air demonstration was to be staged thereat, also athletic contests, a massed band concert, an exhibition of technical equipment, etc., for the benefit of the Army Relief Society, which devotes itself to the cause of destitute widows and orphans of officers, warrant officers and enlisted men. Spectators attending the show were to be charged the sum of 25c for stickers placed on their automobiles.

It was stated that the spectators would probably get their biggest thrills out of the air review of all the combat planes of the post, together with a great variety of other aerial maneuvers and demonstrations, such as figure eights and Lufbery circles.

All of the grounds, airplanes, technical equipment and other points of interest will be open to the public, with uniformed guides from the Air Corps on hand to answer the questions of the visitors. The tactical organizations staging the aerial demonstration will be the 17th Attack Group and the 19th Bombardment Group.

V-6909, A.C.